



Retrofit Experience

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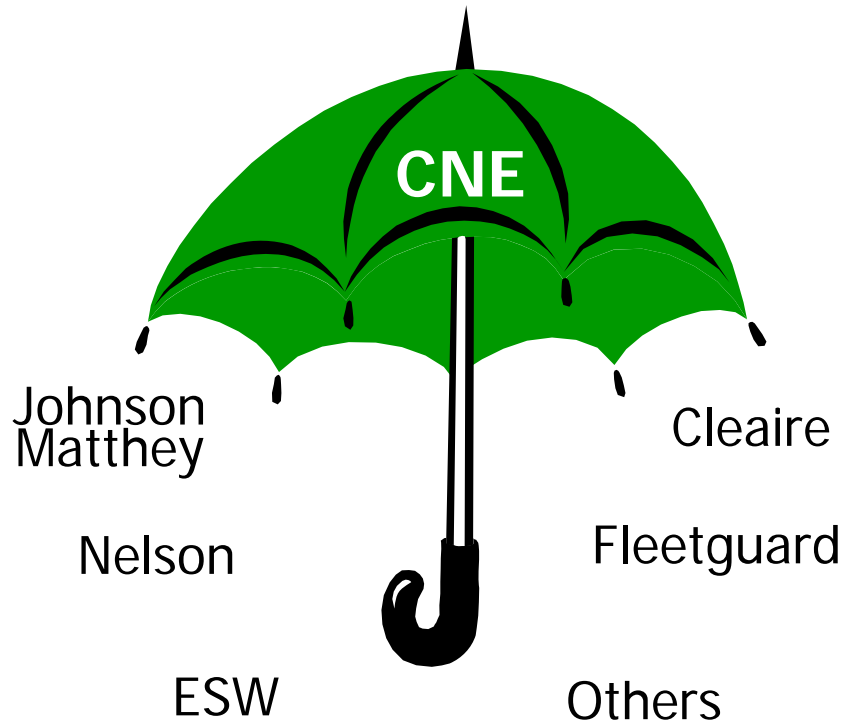
**EVERY
TIME.**

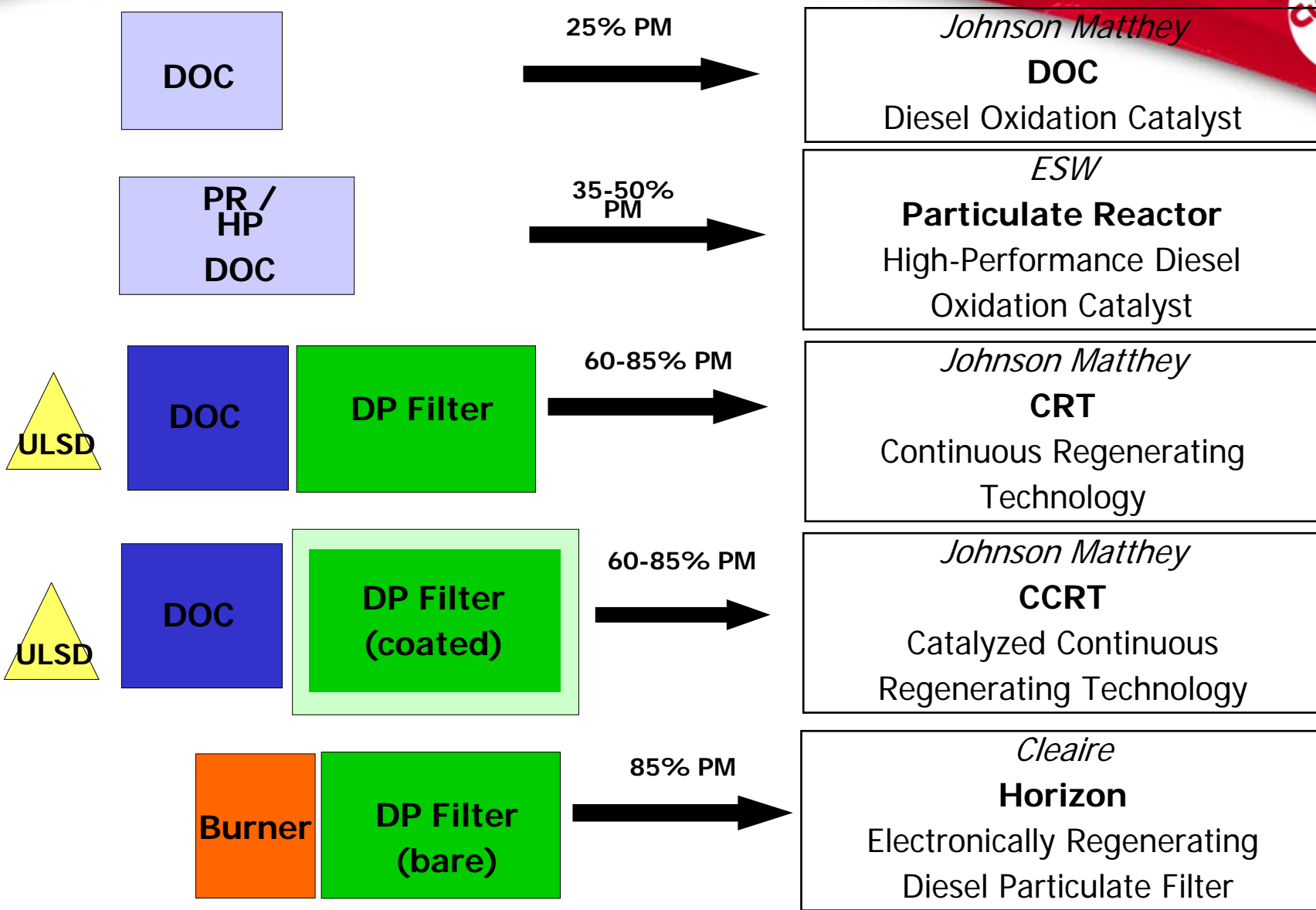


Emission Solutions

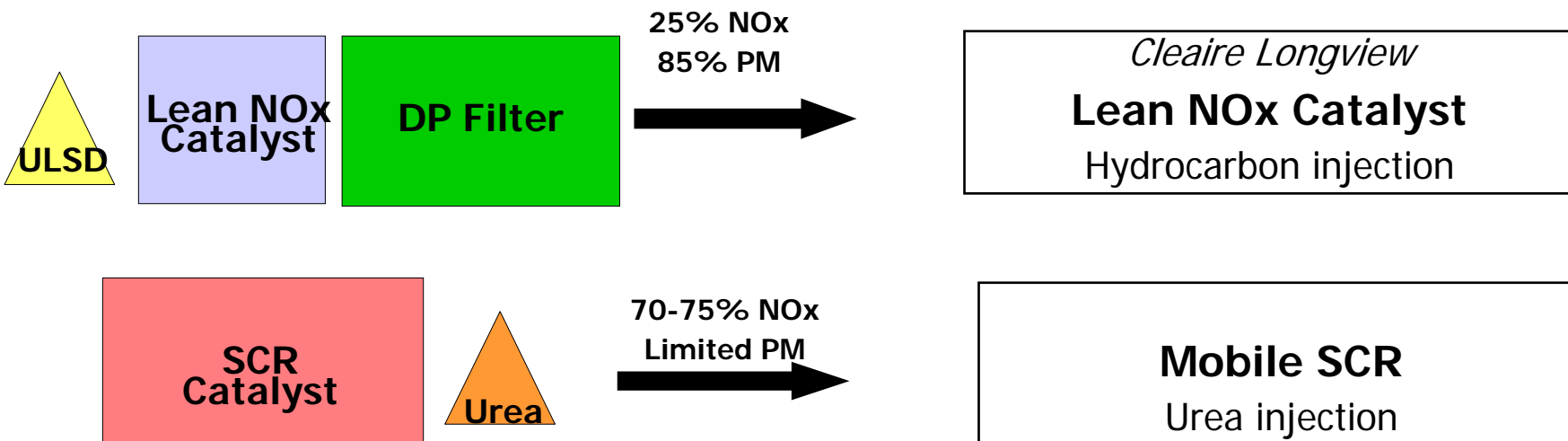


- Cummins Northeast offers a portfolio of emission control systems based on best in class technology & cost for given emission control performance requirements and operating conditions





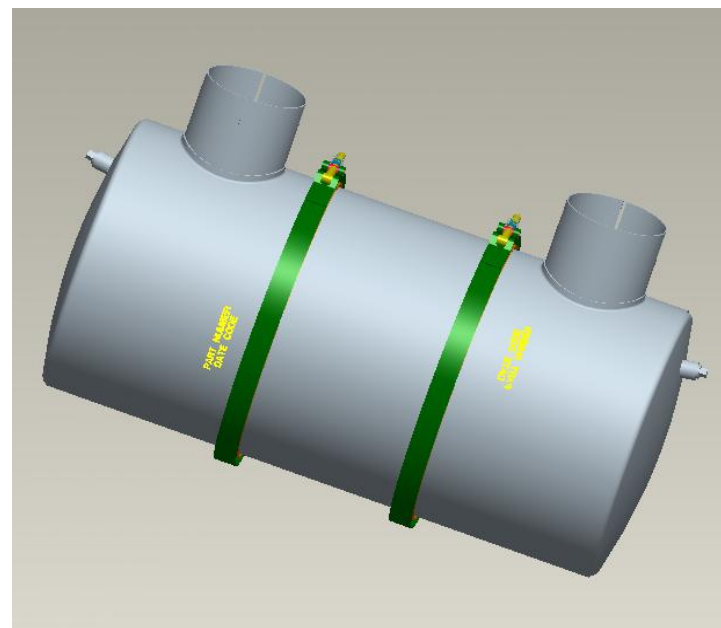
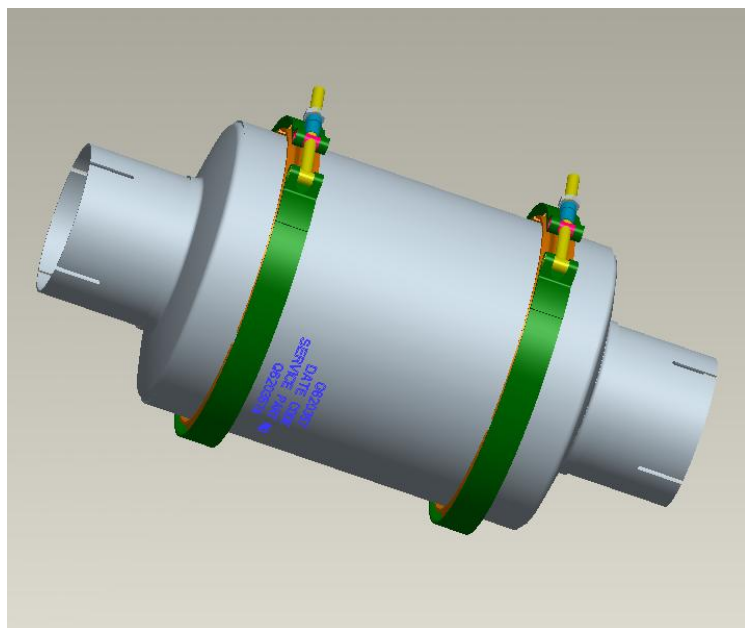
NOx Reduction Technology Overview



Off-Road – Common Issues

- Packaging size, mounting, tubing arrangements, and inlet/outlet mating features
- Water intrusion for vertical tailpipe arrangements due to size constraints
- Vibration levels (Analysis underway)
 - metallic substrates vs. ceramic substrates
- Acoustics and back pressure changes due to aftertreatment incorporation

Off-Road - DOC Standard Line



Other Off-Road Products

- CRT / CCRT
 - ULSD fuel required
 - Application variation (consistent temperature / low backpressure limits)
 - Sizing/location issues
 - Engine certification issues (older cert levels/dirtier)
 - Demonstration and verification work started

- Electrically Regenerated DPF (Horizon)
 - Newest product
 - CARB verification for on-road
 - Removes temperature applicability, engine age and fuel concerns

CNE projects

- Longwood Medical
 - DOCs
- Medford Schools
 - CCRTs
- NYSERDA
 - DOCs
- Toyota Grant
 - CCRTs
- Warwick Public Schools
 - DOCs
- Boston Trolleys
 - DOCs
- Massport
 - Gantry Crane DOCs
 - Yard Spotters DOCs
 - Snow Melters CCRTs
- Boston Public Schools
 - CCRTs
 - Cleaning Contract
- MBTA
 - Cleaning Contract
- NYDOT
 - DOCs

CNE Experience



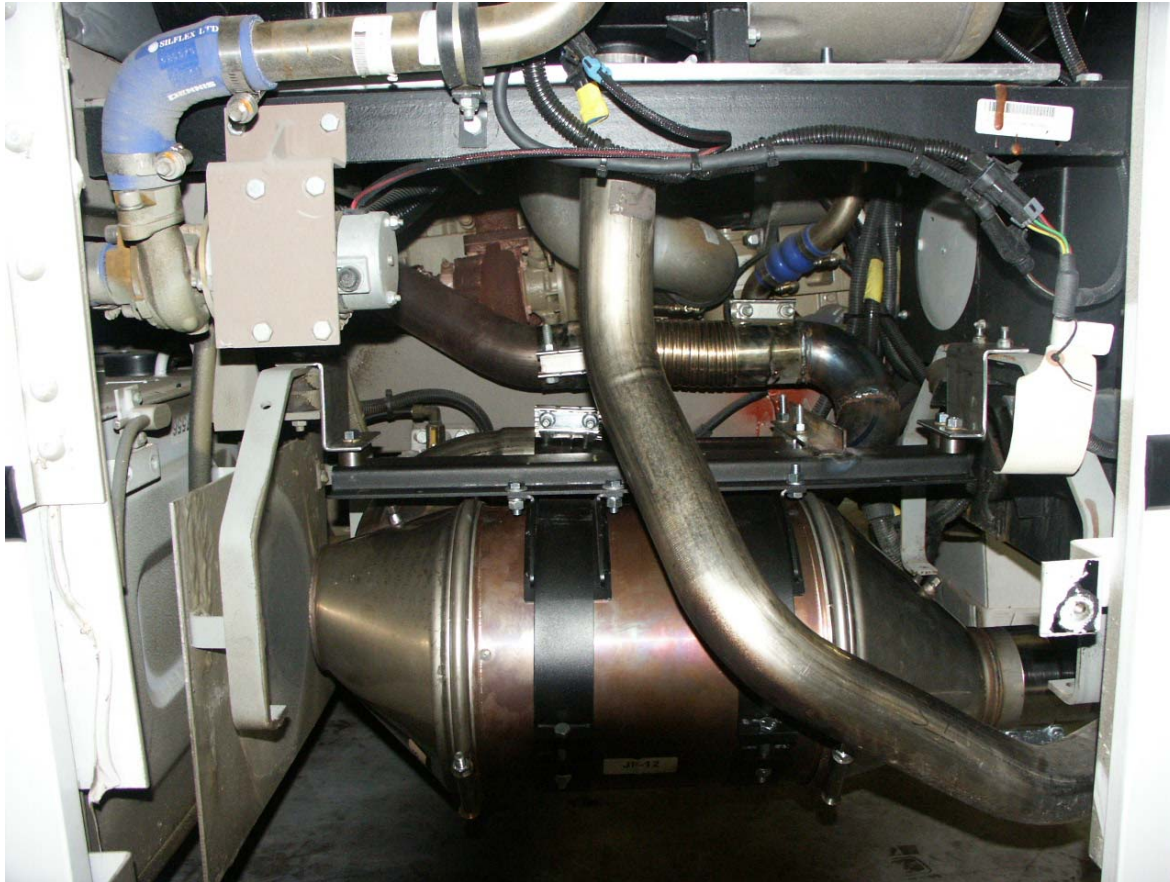
Massport Snow Melter



Medford public schools



Longwood Medical



CCRT install



Considerations

- Temperature Profiles
- Lead Times
- ULSD availability
- Packaging